



Research Paper

An economic analysis of green gram arrivals and price behaviour in Akola district (Akola APMC) of Maharashtra

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ABSTRACT : Agriculture supply is uncertain and this uncertainty in supply leads to fluctuations in prices by two ways seasonal effects and cyclical effects. The broad objective of study was to examine price behaviour of important agricultural commodity green gram in Akola district. The data on arrivals and prices of green gram crop under study for the period of 20 years *i.e.* from 1987-06 were used. The data were collected from the records of Akola APMC. The results indicated that compound growth rate of production and arrival were found to be positively associated in period I (1987-96) of study and negatively associated in period II (1997-2006) of study for Akola APMC. Despite pronounced seasonality in arrivals there were negligible variations in seasonal prices of green gram. Cyclical fluctuations were found to be more pronounced than seasonal fluctuations in prices. This showed that when maximum production is there, prices decreased and increased during the pre harvest month. The C.V. was seen lowest for green gram crop.

KEY WORDS : APMC, Compound growth rate, Seasonal indices, Cyclical indices, Trend analysis, Co-efficient of variation

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INTRODUCTION :

It is said that prices are mirror of economy of the country. The wild fluctuations affect the farmer's capacity of making sustained efforts for increasing production. This fluctuation in prices of agricultural commodity is greatest obstacle in the way of agricultural development. As regards seasonal price indices of cereals it did not fluctuate significantly over month though it moved significantly in the opposite direction of arrival (Dhakate, 1998). Agricultural arrivals and prices, therefore exercise a dominant influence on agricultural economy

of our country. The cyclical fluctuations were found to be more in prices than seasonal variation. The purpose of the present study is to examine the behaviour and pattern of fluctuations in prices and arrivals of green gram for the study in Agriculture Produce Market Committee in Akola district.

Objectives of study :

The present study has been undertaken with the following objectives :

- To study the year wise production of green gram crop.
- To study the market arrivals of green gram crop.

- To study the seasonal variation, cyclical variation and trends in arrivals and prices of green gram crop.

MATERIALS AND METHODS :

The present study has taken into consideration the arrivals and prices of green gram from APMC of Akola district for the period of 20 years *i.e.* 1987 to 2006. Data was analyzed statistically to achieved the objectives of the study.

Compound growth rate :

The growth rates were computed by fitting the exponential function of kind.

$$Y = ab^t \quad \text{in log linear form } i.e. \quad \log y = \log a + t \log b$$

where, t is the time variable y is variable for which growth rate is calculated.

$$b = (1 + r) \text{ and } r = b - 1$$

where, r is the compound growth rate. The significance of compound growth rate was tested by applying 't' test of significance.

General model used for analysis :

Multiplicative model were used for analysis.

$$Y = T \times S \times C \times I$$

where,

Y = Result of the four elements,

T = Trend,

S = Seasonal component ,

C = Cyclical component

I = Irregular component .

Moving averages :

Moving averages of arrivals and prices were worked out for selected Green Gram crop. Moving averages are useful to eliminate periodic movements.

Seasonal index :

$$\text{Seasonal index} = \frac{\text{Actual data for the given month}}{\text{Moving average for that month}} \times 100$$

Cyclical index :

Cyclical indices were calculated for arrivals and prices of green gram from the multiplicative model of time series.

$$\text{Cyclical index} = \frac{P_t}{\hat{P}_t} \times 100$$

$$= \frac{T \times C \times I}{T} \times 100 = (C \times I) \times 100$$

where, P_t = Original price (yearly) \hat{P}_t = Estimated trend value

Trend values :

Linear, quadratic, 3rd degree polynomial and exponential trends are fitted.

Linear :

$$Tt = a + bt$$

where, a and b are the constants or regression co-efficients and ' t ' is time period.

Quadratic :

$$Tt = a + bt + ct^2$$

where, a , b and c are the constants or regression co-efficients and ' t ' is time period.

3rd degree polynomial :

$$Tt = a + bt + ct^2 + dt^3$$

where, a , b , c and d are the constants or regression co-efficients and ' t ' is time period.

Exponential :

$$Tt = ab^t$$

where, a and b are the constants or regression co-efficients of the exponential curve ' t ' is time period.

Co-efficient of variation :

Co-efficient of variation was computed by using following formula :

$$CV \% = \frac{\sigma}{m} \times 100$$

where, σ = standard deviation

$$= \sqrt{\frac{\sum x^2}{n}}$$

where, $x = X - \bar{X}$

$$\bar{X} = \text{mean i.e. } \frac{\sum X}{n} \text{ and } n = \text{number of observations}$$

RESULTS AND DATA ANALYSIS :

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Area and production of green gram in Akola district:

Growth rate is a value which shows an increase or

decrease per unit over the constant values. Compound growth rates were worked out for production and market arrivals of the green gram.

The area and production of green gram in Akola district is shown in Table 1. The area and production shows that average area under green gram crop 51100 ha with average production of 51900 metric tons.

Compound growth rates of production of green gram in Akola district :

The compound growth rates of production of green gram crop in Akola district is shown in Table 2. Compound growth rate for the total period of study was -0.61 per cent. It was negatively significant for the green gram crop.

Compound growth rates in arrivals of green gram :

In case of green gram crop compound growth rate was negative and non-significant in period II of the study. In the overall period of the study (1987-06) it was negatively significant in Akola market.

Compound growth rates of production and arrival :

The growth trend for green gram production was

negatively significant (-0.61%, significant). Also it showed negative trends for arrivals in Akola (-2.74%, significant) (Table 3).

Seasonal indices of arrivals and prices of green gram in selected markets :

The seasonal variations in arrivals and prices of green gram in Akola market are shown in Table 4.

The Table 4 of seasonal indices of monthly arrivals and prices of green gram crop in Akola market shows that the arrivals peaked in the month of September in Akola (502.64) and after that it decline and remained below the arrivals which is observed in the month of May (11.32). The prices observed peaking in the month of April (108.56) in Akola. Then it decline throughout the year till September when the arrivals at its highest and the lowest were seen in the post harvest months of September 86.89 in Akola APMC.

Cyclical indices of arrivals and prices of green gram in Akola market :

The Table 5 of cyclical movements of arrivals of green gram in Akola market showed that the arrival cycle peaked from 2000 to 2003. In case of price cycle it was

Table 1 : Area and production of green gram in Akola district during the period (1992-93 to 2005-06)

Crop	Area (00' ha)		Production(00' metric tons)			
	Max.	Min.	Avg.	Max.	Min.	Avg.
Green gram	520 (2006)	501 (2005)	511	964	94	519

*Values in parenthesis are indicated by year of production

Table 2 : Shows compound growth rates of production for period I (1985-95), period II (1996-06) and overall period (1985-06)

Sr. No.	Name of crop	Period I (1985-1995)	Period II (1996-2006)	Overall (1985-2006)
1	Green gram	12.1043**	-10.2817	-0.6114

** indicate significance of value at P=0.05

Table 3 : Compound growth rates in arrivals of green gram

Sr. No.	Name of crop.	Period I (1987-96)	Period II (1997-06)	Overall (1987-06)
1.	Green gram	-6.2113**	-6.2738	-2.7429**

** indicate significance of value at P=0.05

Table 4 : Seasonal indices of monthly arrivals and prices of green gram in Akola market. (1987-88 to 2005-06)

Month	Arrival	Price	Month	Arrival	Price
July	15.39	100.24	Jan	47.87	100.26
Aug.	97.90	93.91	Feb	23.74	100.01
Sep.	502.64	86.89	Mar	16.64	104.80
Oct.	252.97	94.58	Apr	14.39	108.56
Nov.	124.09	97.28	May	11.32	106.90
Dec.	68.41	100.02	Jun	24.64	106.55

peaked from 1997 to 2001 in Akola market.

Trends in arrivals and prices of green gram in Akola market :

It is important item of an economy any distortion in agricultural prices leads to disturbing of the whole price structure. Prices may rise faster at time or may fall rapidly due to a temporary imbalance of supply and demand. Both sharp rise and precious fall in agricultural prices have dangerous potentialities. One of the major factors responsible for temporal rise in prices is inflation. Estimate of trend in arrivals and prices are given in Tables 6.

The Table 6 of trends in arrivals and prices of green gram crop in Akola market shows that, the percentage change is the ratio of difference between averages of last 3 years *i.e.* 2004 to 2006 over initial 3 years *i.e.* 1987 to 1989 have been worked out. It shows that there is

negative increase (-32.78%) in arrival of safflower. In case of price trend it shows that the price of safflower (244.82%) increases.

Co-efficient of variation in real prices :

Inflation had been the one of the important reason for rise in prices. If the inflation effect is eliminated, the real movement in prices is seen. The method of co-efficient of variation of yearly prices was used to measure the yearly variations.

Co-efficient of variation between yearly inflated prices of green gram shown in Table 7. For the period 1987 to 2006 for the Akola market. The variability in green gram crop prices ranges 39.85 per cent in Akola market. This high degree variation in prices introduces an element of uncertainty and is not very conducive to rational management decision of the farmers the

Table 5 : Cyclical indices in arrivals and prices of green gram in selected markets (1988-89 to 2004-05)

Year	Arrival (Qtl.)	Price (Rs.)	Year	Arrival (Qtl.)	Price (Rs.)
1988	114.02	98.09	1997	94.89	114.61
1989	90.57	92.44	1998	110.60	112.73
1990	83.72	83.97	1999	103.77	110.30
1991	80.44	86.59	2000	111.85	109.26
1992	83.27	93.56	2001	128.75	108.65
1993	97.85	94.80	2002	138.88	98.00
1994	96.45	97.07	2003	140.56	84.15
1995	79.40	107.11	2004	103.06	86.04
1996	75.67	115.22	2005	64.67	98.00

Table 6 : Trends in arrivals and prices of green gram in Akola market (1992-93 to 2005-06)

Year	Arrival (Qtl.)	Price (Rs.)	Year	Arrival (Qtl.)	Price (Rs.)
1987	11076.15	516.57	1998	8771.48	1472.56
1988	10866.63	603.48	1999	8561.97	1559.47
1989	10657.12	690.39	2000	8352.45	1646.38
1990	10447.60	777.30	2001	8142.94	1733.29
1991	10238.09	864.21	2002	7933.42	1820.20
1992	10028.57	941.11	2003	7723.91	1907.10
1993	9819.05	1038.02	2004	7514.39	1994.01
1994	9609.54	1124.93	2005	7304.88	2080.92
1995	9400.63	1211.84	2006	7095.36	2167.83
1996	9190.51	1298.75	% change	-32.78	244.82
1997	8980.99	1385.65			

Table 7 : Co-efficient of variation in real prices (1987-2006)

Crop	C.V.	Mean
Green gram	39.85	1342.20

government has also failed in this line. Thus, the necessity of farming right plan by the government to lessen the risk is necessary to stabilize prices.

Conclusion :

Following general conclusions emerge from the present study.

- The monthly seasonal indices for green gram arrivals were started from September and arrivals peaked in the month of September. The fluctuations in prices were negligible.
- Cyclical fluctuations were found to be more pronounced than seasonal fluctuations in prices.
- Co-efficient of variation of real prices was found to be highest in green gram.

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